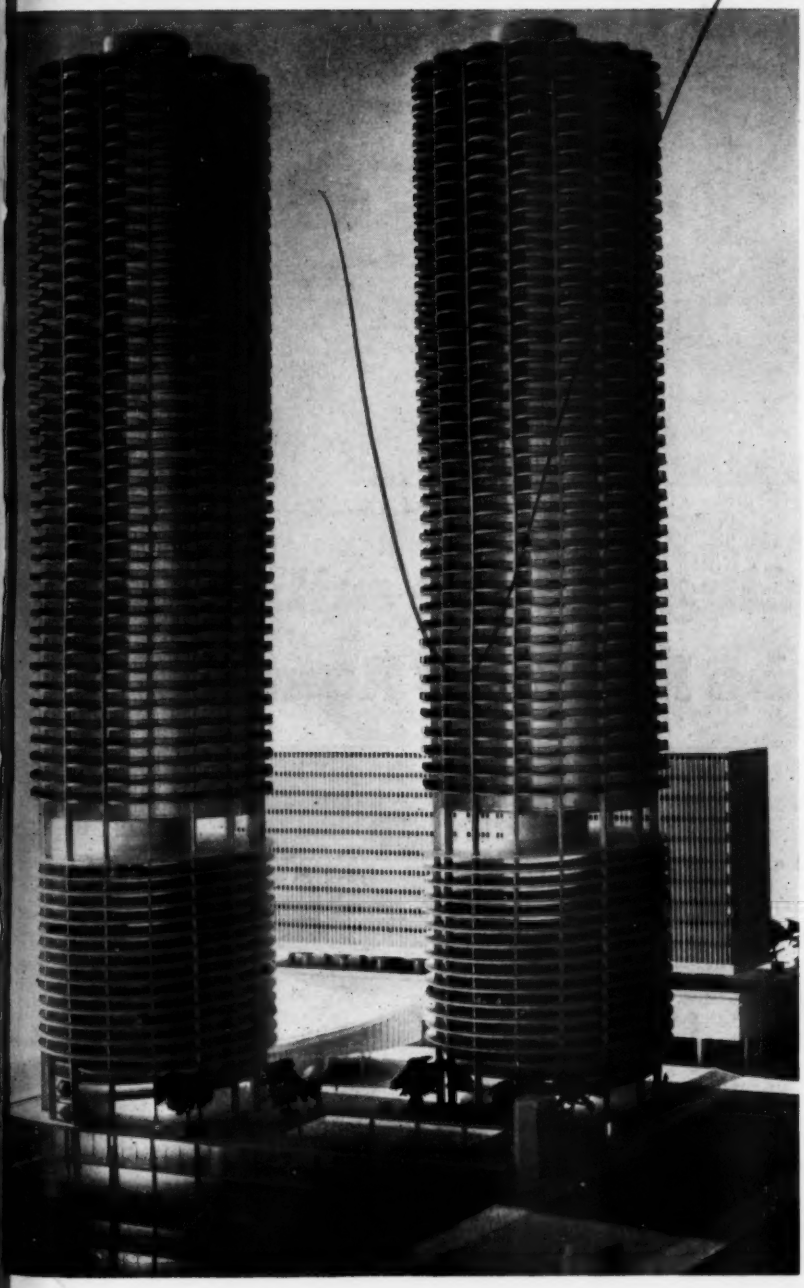
ERVING THE PROFESSION OF ENGINEERING

WESTERN SOCIETY OF ENGINEERS'

92 ND YEAR

Midwest Engineer



MARINA PROJECT

These 60-story twin towers will be the world's tallest apartment buildings. They are part of the Marina City center now under construction on the north bank of the Chicago River on the edge of the Loop. Included in the $36 million project are a 10-story commercial building, a theater, bowling alley, shops and gardens. Parking facilities occupy the first 20-stories of the apartment structures.

Page 5

PUBLIC LIBRARY
JAN 23 1961
TECHNOLOGY DEPARTMENT

CONTENTS

Impact of Industrial Development on the Chicago Area
Page 6

Progress of Russian Railroads
Page 12

New WSE Management Programs
Page 16

News of Engineers
Page 18

January, 1961
Vol. 13, No. 5

Gamma ray equipment used to measure sub-surface densities

Scientific readings by the millions... recorded in the National Road Test

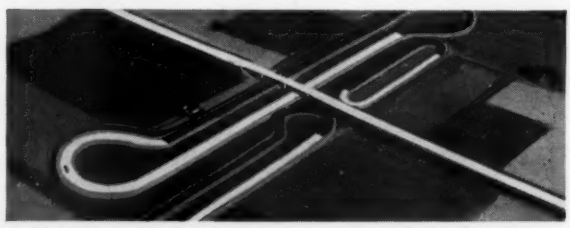
Sponsored by the American Association of State Highway Officials (AASHO), this 27-million-dollar test will provide "statistically unassailable" facts on modern pavement design.

On November 30th traffic ended on the 5 concrete and asphalt test loops near Ottawa, Illinois. 17 million miles of travel were marked up by the fleet of loaded trucks.

The entire National Road Test project is the most scientific experiment ever carried out on highway pavements. Modern statistical techniques, the newest in instrumentation, recording and automatic data processing equipment assure the total reliability and impartiality of findings.

Vital data have been pouring in, useful new facts on pavement performance are evident. The final result—a storehouse of engineering information needed by every engineer, official and legislator to plan and build the most practical, efficient road system possible.

For Interstate highways—and all roads and streets—the National Road Test will prove the most significant test of pavement types of all time.



836 test sections—repeating nearly 200 different pavement combinations make up the loops. Over 1,100,000 load applications have been recorded.

PORTLAND CEMENT ASSOCIATION

111 West Washington Street, Chicago 2, Illinois

A national organization to improve and extend the uses of concrete

WHY ELECTRIC PROPULSION FOR SPACE CAPSULES?

Advantages explained at recent annual meeting of ASME

May 4, 1964, may be the date when Americans send a space capsult hurtling to Mars.

Some theories on the accomplishment of the mission were presented this morning at the Winter Annual Meeting of The American Society of Mechanical Engineers in New York.

Harold Brown of the Flight Propulsion Laboratory Department, General Electric Company, Evendale, Ohio, suggested the date to his engineer audience on Nov. 28 because that's when Earth and Mars would be in the best position to permit an electrically-propelled capsule to reach orbit around the planet. Such a period comes only once every few years.

The capsule, under continuous power, would arrive in the vicinity of Mars around November 3 and be in orbit around that planet on January 4, 1965, said Mr. Brown.

Low thrust electric propulsion, in contrast to the more conventional chemical or nuclear systems, would be used, Mr. Brown continued, because the capsule could carry a much larger payload. Electric systems weigh less, although they might not get to their destination quite as fast. A chemical propellant would send a capsule into orbit around Mars 215 days after it left Earth, but with a payload of 10 per cent of the weight. An electrically propelled capsule, on the other hand, would arrive 245 days after being sent into its arc, but would have a payload of 45 per cent.

An even greater payload could be carried in a "freight capsule," Mr. Brown suggested. This kind of space traveller would be under direct propulsion only for a comparatively short part of its journey, less fuel would be required, and more room would be left for carrying goods, even though the journey would be comparatively slow. For instance, once such a capsule left its orbit around Earth, say on August 18, 1964, it would need propulsion only during the week of December 24 to arrive for a Mars orbit sometime around the 29th of May, 1965. Such a capsule could carry a payload of 56 per cent.

All the missions he described, said Mr. Brown, originate from a 300-mile near-circular orbit about the Earth and terminate in a low-altitude circular orbit about Mars.

"Low thrust electrical propulsion will be available for operation in space within the next few years," Mr. Brown said, and "the full potential of electrical propulsion systems will not be realized until they are capable of application to interplanetary missions. For such missions, the electrical propulsion system is capable of maintaining its payload advantage over the chemical rocket system while competing favorably on a total mission operating time basis."

The Navy may soon use a new kind of lightning bug to help power space missiles. According to *Product Engineering*, batteries which work with the aid of bacteria are being experimented with.

Midwest Engineer

84 E. Randolph St., Chicago 1
Telephone: RAndolph 6-1736

JOSEPH L. WHITE, *Managing Editor*

ROBERT H. BACON, *Board Representative*

MILTON PIKARSKY, *Chairman, Publications Committee*

WILLIAM J. SEAL, *Vice-Chairman, Publications Committee*

MARTIN M. BLACHMAN, *Chairman, Advertising Committee*

ERVEN M. GUY, *Vice-Chairman, Advertising Committee*

MIDWEST ENGINEER is published monthly except June, July and August by the Western Society of Engineers at 84 East Randolph Street, Chicago 1, Illinois. Entered as second class matter at the Post Office at Chicago, Illinois, under the Act of March 3, 1879. Single copy, $.50; annual subscription, $4.00; foreign subscription, $6.00. The Society does not assume responsibility for statements and opinions in articles, papers, and discussions appearing herein.

Copyright, 1961, by the Western Society of Engineers.

SOCIETY OFFICERS AND TRUSTEES:

R. D. Maxson.....*President*
Philip L. Coleman.....*1st Vice-President*
Frank M. Scott.....*2nd Vice-President*
Ernest R. Hendrickson.....*Treasurer*
Fred R. Bruce.....*Executive Secretary*
W. R. Marston.....*Past President*
J. T. Rettaliata.....*Past President*

Trustees:

Robert H. Bacon — Maurice W. Lane
W. M. Ballenger — Philip J. Larson
John R. Conrad — Marvin V. Maxwell
John P. Gnaedinger — Carl A. Metz
V. E. Gunlock — Eugene Stankiewicz
Harry P. Hagedorn — Graydon W. Trout

Calendar of Chicago Engineering

—JAN. 24, TUES. WSE General Meeting and Dinner. Social Hour (5:15-6:15 p.m.) Dinner (6:15). Dinner Speaker (7:15-7:45) Technical Sessions (8:00). At WSE Hq.

—JAN. 25, WED. NO WSE Noon Luncheon Meeting. Reserved for ASME.

—FEB. 1, WSE Noon Luncheon Meeting, (12:00 noon). At WSE Hq.

—FEB. 8, WSE Noon Luncheon Meeting (12:00 noon). At WSE Hq.

—FEB. 8, West Suburban Division Dinner (6:30 p.m.) and Meeting. (7:40 p.m.). At Remick's Lilac Lodge, Wolf & Cermak roads, Hillside, Ill.

—FEB. 15, WED. WSE Civic Committee Dinner (6:15 p.m.) and Meeting. At WSE Hq.

—FEB. 15, WED. No WSE Noon Luncheon Meeting. Reserved for ASME.

—FEB. 28, WSE General Meeting and Dinner. Social Hour (5:15-6:15 p.m.) Dinner (6:15). Dinner Speaker (7:15-7:45). Technical Sessions (8:00). At WSE Hq.

—MAR. 1, WSE Noon Luncheon Meeting (12:00 noon). At WSE Hq.

—MAR. 2, Washington Award Dinner at Furniture Club of America.

Night in the Orient

Recalling a pleasant and memorable event

Bob and Ruth Bacon, who by report of their 'Round the Pacific Trip, highlighted by color movies, transported Ladies Night guests to the Orient.

The Night in the Orient Party of last month exceeded all expectations. Views of the affair shown here reveal how guests enjoyed an 8-course Oriental dinner just like one would be served at the famous Tai Pak.

The after-dinner program featuring color films taken by the Bacons transported the viewers to Djkarta, Bali, Singapore and Jahore in Malaya, also Thailand and Bankok. And, of course, Cambodia and a look at the famous Angkor Wat and Angkor Thom.

WSE president Raymond D. Maxon and Mrs. Maxon (left) pause for the photographer to snap them wearing their leis which everyone donned for the dinner.

"Tiny" Adams, Program Committee vice chairman and Mrs. Howard Carter are obviously enjoying the "Trip to the Orient."

A few more of the many guests who enjoyed last month's gala affair.

Howard Carter, Chairman, Program Committee and Mrs. Merlin J. Adams take first taste of 8-course Oriental dinner.

All-Metal Lath Home Construction Growing In Volume

The frame construction of private homes may become out-dated.

Why? Because of plaster walls constructed on a strong, impact resistant mesh of metal lath which is supported on solidly installed vertical steel studs. Enthusiastic promoters of the metal lath manufacturing industry, also see the day dawning when finished, prefabricated metal lath for plaster wall sections are transported straight to the housing sites from the production lines. This unusual, overall invasion of the housing market is being foretold at the Cleveland headquarters of the Metal Lath Manufacturers Association. Already turning out many million square yards of metal lath annually, the industry is pushing the all-metal-lath home construction. When successful, this major industrial move will open a wide major market for the low carbon sheet steel used to manufacture expanded metal lath.

The metal lath boosters claim the all-metal-lath home may be the solution to soaring construction costs for private dwellings. Time savings in erecting an all-metal lath home run from 30% to 50%, compared with the time it takes to build other types of homes, the Association says. This, naturally, results in a reduction in labor costs.

Forerunners of the new concept in home building were erected in Florida five years ago. The all-lath construction consists of hollow partitions. The inner partition is made up of a diamond mesh to take the plaster. The outer partition, which uses a heavier steel lath, is designed for the application of a number of finishes, including stucco, brick, stone or ceramic panels.

Instead of the usual wooden studs, the steel lath is affixed to steel studs and channels.

They are not only less costly to build but to maintain, an industry spokesman said.

The finished product is an "expanded" lath containing diamond-shaped openings with sloped steel strands.

W. H. LYMAN CONSTRUCTION CO.

Established 1878

General Contractors

Underground Conduits, Pipelines and Building Construction

•

134 N. LA SALLE • CHICAGO • RANDOLPH 6-0200

Our Cover Picture

Concrete cassion foundations for the Marina City center apartments are being installed with the world's largest construction drill built by Case Foundation Co., Roselle, Ill. It is 8 stories tall, weighs 120 tons, penetrates any type soil to depth of 200 ft. Architect Bertrand Goldberg is the designer. Marks & Co. are managing the project.

Announce Subjects of February 28th Technical Sessions

The February 28 general meeting will offer two exceptionally interesting technical sessions. The first, sponsored by the Chemical and Metallurgical Section will present Professor Thomas L. Joseph, Professor of Metallurgical Engineering, University of Minnesota. His subject will be "What's Ahead for the Iron Blast Furnace."

The second session is sponsored by the Bridge and Structural Engineering Section. It will present Roger H. Hildebrand and John P. Fitzgerald, of Argonne National Laboratories. They will discuss the particle accelerator.

Joseph L. White Named Managing Editor Of Midwest Engineer

With this issue of *MIDWEST ENGINEER*, Joseph L. White becomes its Managing Editor, succeeding Harold K. Eaton. Culminating seven years of valuable service to WSE, Mr. Eaton now joins Scott Foresman & Co., educational publishers, in a production capacity.

Mr. White has been identified with industrial publishing for well over twenty years. After completing his studies at Columbia University he began his editorial activities with the American Paint Journal, St. Louis. Moving to Chicago, he worked on magazines in the lubrication and construction fields. From 1942 until 1958 he was with Putman Publishing Co., for many of these years serving as Managing Editor of *CHEMICAL PROCESSING*. More recently he has edited automotive papers.

IMPACT OF INDUSTRIAL DEVELOPMENT

A vital problem for the Chicago area

- **Plant relocation**
- **Movement to suburbs**
- **Transportation**
- **Land Clearance**
- **Parks for Industry among prime considerations**

A recent survey by Dr. Buford Brandis of the United States Chamber of Commerce attempted to measure the economic effects of new industry on the community.

He took a carefully selected sample of 9 counties in which manufacturing employment had more than doubled between 1940 and 1950.

He found that for every 100 additional industrial employes there were 112 more households in the community, bank deposits increased by $270,000 a year, retail sales by $360,000 a year and personal income $590,000 a year.

It is evident that the creation of industrial employment in a community necessarily brings a multiple expansion of economic activity.

A Classic Example

A classic example of this competition in our area was in Fulton, a town of less than 3,000 people which, perhaps, you never knew existed.

This community is located on the Mississippi River across from Clinton, Iowa. Because of the aggressive activity of Clinton in soliciting industry, Fulton had become satisfied to supply the labor requirements.

However, taxable benefits were going to Clinton and cost of taxes were being borne by Fulton in so far as less money was available for expenditure in their home town.

This condition became steadily worse until it appeared that not only the commercial activity but the town itself was facing bankruptcy. What was more important to the people was losing its identity as a town.

Aroused to their own need, a local group with our direction was able to persuade, inside of 16 months, four new industries to come to Fulton.

The goal of the committee was to get several very small employers, rather than one large employer, in order to diversify the impact on the local economy in event of business recession.

This same sort of diversification of the benefits thereof could be multiplied many times in the application to any large city. Detroit, Los Angeles, Akron, South Bend, and Gary are cases in point of a lack in broad industrial employment.

If you look in any publication read primarily by businessmen you will find many advertisements by railroads, power companies, chambers of commerce, and state development commissions urging industry to locate plants in their particular area.

There have been no statistics as to how much money is spent on this type of advertising but it is certain to be many millions of dollars each year.

Everybody's Business

What is industrial development? Actually, it is everybody's business because it affects everyone, but it is also a professional activity for an increasing number of people.

In some ways it can be likened to a science. For example, it is possible to predict with reasonable accuracy the benefits and adjustments that will flow to a community with the introduction of a new economic activity.

Again we are learning how to evaluate what combination of resources and what location will lead to what development.

What advantage would it have been to little Fulton for them to have advertised in the Wall Street Journal that it is also an ideal spot for industry to grow?

Here the emphasis had to be placed on directed local enthusiasm.

Loren Trimble, Director of Industrial Development, Commonwealth Edison Co., presented this talk before the Civic Committee of the Western Society of Engineers on May 18, 1960.

Utility companies have a special interest in industrial development. They are charged with a public responsibility.

Not only are they controlled by governmental agencies as far as rates, franchises, and other matters are concerned but they are permitted to operate as monopolies in their territory, and their progress is closely associated with the economic health and welfare of the community.

It is only by promoting the interest of the community it serves that a utility company can grow. It cannot, like some other business companies, close down its plant and move to another area.

It is well to add also that good customer and employe relations are built through a program of fostering the community's economic interest.

Utility Company Aid

The public utility company therefore finds itself with a commitment to aid the community and its economic expansion, and this usually means through industrial development.

Commonwealth Edison Company through its Public Service Division was particularly active in this field as a distinct operation in the early 1930's.

However, our industrial development activity did not come into its own until the formation of the existing department in 1945. The primary motive was to bring to the attention of as many people as possible the potentiality of the area, not only industrially but also commercially, agriculturally, and as a place to live and work.

The secondary motive was a desire to sell more electricity to the new industries and the homes that would result.

The third motive which dictated participation in this promotional activity stems from the fact that the northern Illinois region, which had always been regarded as an independent industrial area, had no other comparable promotional group.

Originally we operated with a rather large staff for purposes of calling on prospects in other parts of the country; and in one year more than a half million dollars of advertising was used in this behalf.

Because of meaningless national competition, and duplication of effort, about five years ago our organization dropped in number to 11 people that are currently on the staff.

We have long since dropped the lone wolf strategy of cold solicitation supported by advertising in favor of cooperative effort with other organizations who have the same goal.

Northern Illinois is perhaps the most desirable location for an industrial operation, not only because of the geographic position, but also because of such supporting factors as being the center of all types of transportation and the center of a vast marketing area.

As an industrial activity we seek to locate new industry in our operating area and to hold the industry we now have.

Since 1945 the growth of industry has attracted considerable other professional interest in development work. Banks, railroads, chambers of commerce all now have their own development activity.

Certain realtors are highly specialized in industrial work. A considerable portion of our time is used in liaison between these various interested groups. We are a source to them of factual matters relative to site data and other economic information pertinent to factory location.

We must operate under the principle that an industry is going to locate a plant only in a location where it expects to make a profit. Every other consideration is secondary. From time to time the emphasis changes from industry to industry, but generally the greatest movement has been among the so called light industries that make good neighbors.

For that reason we have emphasized areas of promotion at times when they appeared most critical.

Only four years ago farm land adjacent and to the west of O'Hare Field could have been purchased for $500 an acre. Today in that same area raw land sells for approximately $3,500 an acre. We were successful in inducing Centex of Dallas, Texas to speculate on almost 3,000 acres which will ultimately yield 12,000 homes and locate over 50 industries.

Areas of interest to industry also shift from time to time. The Illinois Waterway today is an exceedingly attractive location, primarily to the chemical industry, because of the splendid barge facilities available.

In the United States some 5,000 are employed in industrial development work. Expenditures for industrial development — public and private probably exceeds 200 million dollars.

It is to our interest to draw the attention of the most likely people to these various areas so that they can be developed and offered for the benefit of everyone in this region.

There is much evidence that many people are in favor of industrial development. Each one of the Canadian Provinces and all of our states have departments of industrial development.

Most power companies and railroads as well as banks have such departments. There are, in addition, many local foundations, chambers of commerce, and other groups operating within each community.

In the United States it is estimated that more than 5,000 persons are currently employed full time in this work. Several states have industrial development budgets of more than one million dollars per year.

I would say that the annual expenditure for industrial development both public and private in the United States alone may exceed 200 million dollars. Obviously industrial development is big business.

Because of the tremendous interest in industrial movement many comparative analyses have been made between different areas within the country. Recently Columbia University completed a study of a comparison of actual growth the state would have had, if it had changed at the same rate as did the nation between 1929 and 1954.

You will note on this comparison that Illinois ranks 35th in position of this report in a period of the greatest growth, which means that we are 645 million dollars or 6 per cent as a minus figure compared to the national average.

By this study Illinois makes a poor comparison with the promotional efforts

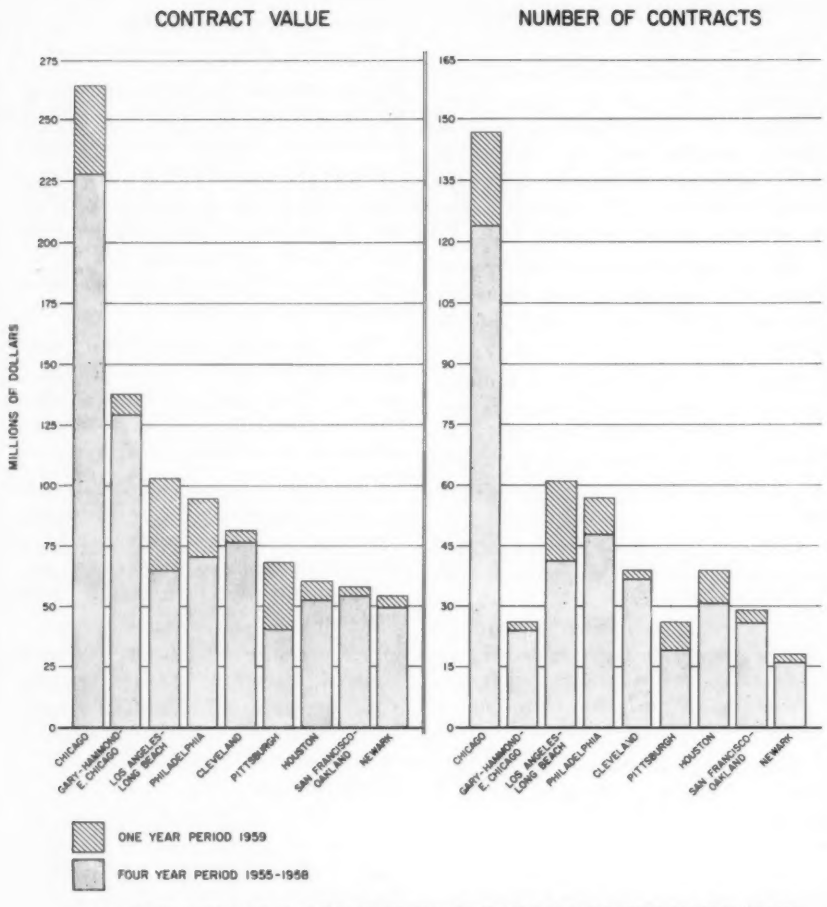


Figure 1

of the larger number of states if we left the matter at that point. However, state by state comparisons are convenient tools since data is readily available.

The Great Lakes states still dominate the national in industrial growth. The new booming centers of the South and West create much attention because of their speed of development, but the hard-core center of manufacturing is definitely contained within Illinois, Michigan, Wisconsin, Indiana, and Ohio.

The use of electricity in the growth of industry makes a comparison on a more realistic basis. Here in a ranking comparison Illinois is fifth, and in the adjacent columns of the total value added by manufacturing in 1954, Illinois ranks fourth.

Obviously the Columbia study, since it is one of relative change, does not have the complete story in fact for comparison. It is merely cited because some publicity has already been given to it and I am sure that much more will follow in the future.

States are political boundaries and are not economic units. Metropolitan areas have been designated by the Bureau of the Budget, Office of the President and the comparison for the leading areas of the country are shown in Figure 1.

You will note in this five-year study that the Chicago area lead in contract value and in number of contracts is three times as great as its closest competitor.

The darkened portion at the top of the bars showing the one-year period is also greatly in favor of the Chicago Metropolitan Area. One of the basic factors contributing to this situation is the excellent tax climate in Illinois for industry.

The lack of an individual income tax in favor of sales tax has unquestionably given this state a tremendous competitive advantage over its immediate neighbors.

Movement to Suburbs

The so-called population explosion began approximately in 1950 and has continued with a changeable pace until the present time.

This growth took form in an outward movement from Chicago to the suburban area.

In Chicago meanwhile population growth has continued in spite of the outmigration. However, the growth is maintained in the city by large numbers of non-white groups. The population that left the city is on an average in a higher income group and has been replaced with those with relatively low purchasing power.

At the same time considerable amount of urban modernization started taking place in Chicago proper. This consisted of improved housing and arterial highways.

These improvements took place in what had traditionally been the densest industrial areas of the city.

Improvement in technology at the same time had compelled industry to install newer types of machinery that could only be operated in a single story building.

This combination of factors, labor movement from the city, urban modernization, and technical improvement in the plants, combined to cause considerable industrial movement to the suburbs.

In their place, to be sure, moved a certain number of smaller industries

The greatest pool of fresh water in the world is on Chicago's doorstep. Yet confusion is preventing its use a few miles inland.

which in no way compares to the total leaving, to the end result that there exists today over 12 million square feet of empty multi-storied space. Industry did not move to the suburbs for these reasons alone.

Chicago was and still remains the most attractive area for location of industry. But with the almost complete absence of industrial land on the north side, industry has no alternative except to move out of the city. This result of movement of population and industry has faced the suburban areas with basic problems in water sources and sewage disposal.

Cook County, which has received the bulk of this outward movement, is excepted from this deficiency because of the existence primarily of the Sanitary District and the Chicago water supply. However, the future of those areas outside of the periphery established by Cook County will be determined by their ability in getting adequate water and sewers.

The most plentiful natural resource is water. But in many areas of the country a serious water shortage exists or is developing. The problem is to get the water to where it isn't.

Nobody is more concerned about water than industry whose present daily usage of 80 billion gallons will increase to 200 billion gallons by 1975. Whatever the product, the choice of any plant site often depends on how much water is available.

The greatest pool of fresh water in the world is on Chicago's doorstep. Yet, general confusion is preventing its use only a few miles inland. Many plans of distribution exist but completion and leadership must soon be in evidence if we are to successfully compete with other areas of the country.

Water is not short in northern Illinois, however water tables have been dropping fast because of heavy pumpage and this water is getting increasingly more expensive to procure.

These cost factors in procurement in comparison with the same factors elsewhere will determine the relative growth of these areas.

It should be noted here that the economic growth of the suburban areas and of Chicago itself are interdependent. One cannot succeed and have the other fail, both must succeed together.

Economic areas unfortunately do not parallel political boundaries. Therefore, the problem becomes more acute before it can be solved.

A strong healthy prosperous city of Chicago remains the basis for all growth in this area. The question might be asked: can industry continue to expand indefinitely?

The growth of population and of strong purchasing power seems to be fundamental to our economy.

Increasing Costs

Over 65 per cent of the products now in everyday use did not exist before World War II. The manufacturer in order to stay in business is faced with the alternative of increasing his prices or increasing his production. Increased labor costs have shown him no alternative.

It is quite indicative that our method of merchandising is rapidly changing as evidenced by the lack of support for a federal fair trade law and a plentiful supply of discount houses.

The margin of price as established by the cost of manufacturing compared to what the consumer will pay for it is growing ever narrower.

Rapid communication and education have alerted the consumer to true value, thus the competition of manufacturers in various products will continue to be keen.

Since production is dependent upon the ability to produce, the manufacturer must replace plant and equipment when they become obsolete. This is something new for industry which has been known in the past to replace machinery only when it became worn out.

It took about $17,000 of invested capital recently to furnish the average industrial worker with the tools of his trade. By 1970, it will take an estimated $30,000!

Thus industry is dedicated to continue the practice of capital investment and plant expansion. Research budgets, scheduled to expand from $8 billion in 1958 to $15 billion in 1965 bear out this contention.

Now I would like to relate a story to illustrate a case in point.

The Allis Chalmers plant at Cedar Rapids, Iowa is a major farm equipment manufacturer which has long been served by the adjacent railroads.

In the past few years their shipping has been switched so that today over 90 per cent of the traffic travels by truck. The railroads met the differential in freight rates, upon which the trucking groups immediately decreased their tariff. This the railroad was unable to meet.

The situation in favor of truckers was that they carried livestock to the Chicago markets, then picked up steel for the return load.

The fact that a full load could be carried both ways decided the operating efficiency in favor of the trucks. This was the real situation that the railroad was unable to meet.

A group from the University of Illinois was recently commissioned to make a careful study of the potentiality of the St. Lawrence Deep Seaway and the inland waterway showing the possible economic benefits to Chicago.

Return Cargoes

Their study indicated that although Chicago had already received considerable benefit from waterway traffic, increased benefits were unlikely unless some positive measures were taken whereby the ships would be supplied with traffic both ways.

The report made it quite obvious that the seaway was not conducive to improving the economic picture of the Chicago area without considerable help. It possesses no magic touch whereby from its activity alone the situation would be much changed from the trend already established. However, the industrial attractiveness of the area is improved by the seaway.

One of the basic factors in the city is the movement of industry to the suburbs and leaving empty loft space.

As an example, when Automatic Electric Co. moved to Northlake, Illinois, it left 17 multi-story buildings vacant in the city. You will recall my mentioning that at the present time there are more than 12 million square feet of industrial space available. In spite of this however, Chicago is growing.

ESTIMATED EMPLOYMENT AND ANNUAL ELECTRIC REVENUE OF INDUSTRIES (10 OR MORE EMPLOYES) WHICH MADE ARRANGEMENTS TO LOCATE IN CHICAGO AND NORTHERN ILLINOIS

1950-1959

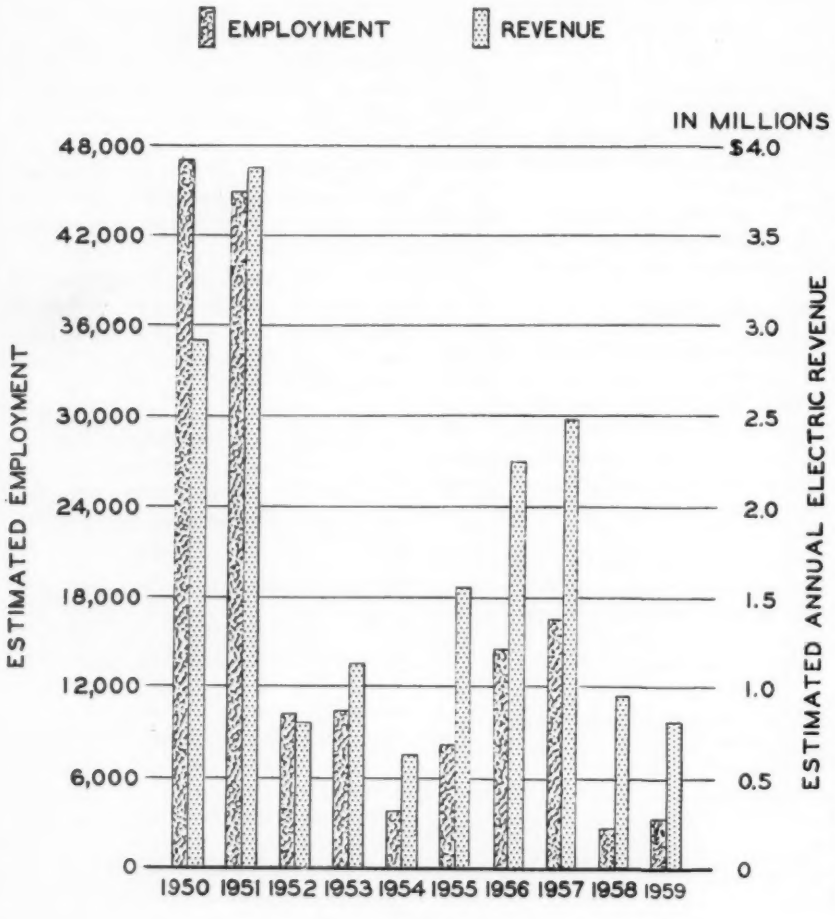


Figure II

The vacant loft space is providing a place to develop the small manufacturer just starting in business. These areas also provide space for the small existing manufacturers in the city that need room to expand. However it is not always possible for the owners of these properties to improve them to such an extent as to make them attractive.

Certain few buildings have been converted to first class office space. You will recall that the Merchandise Mart and the Butler Bros. buildings were once industrial loft space.

However, considerable money is needed for this type of conversion and the location is most important.

Just how are we doing at the present time? A good gauge of growth in this region is the use of electricity and the number of employes in each establishment. See Figure 2.

On this chart you will notice that in the year 1950 for new plants that located in northern Illinois, considerably larger numbers of people were required in comparison with the amount of electricity used.

However, the trend reverses itself starting with 1953 in which the amount of electricity considerably exceeds the rate of employment. This, of course, proves the point of the use of machines wherever possible in place of workers and the greater need for building space to house these machines.

In 1958 we had 31 new industries establish in northern Illinois with 2,700 employes. In 1959 we had 52 industries with 3,500 employes.

Chicago Attractions

Of interest is the fact that in 1958, 39 factories moved from Chicago to the suburbs with 4,400 employes and in 1959, 26 industries moved from Chicago with 3,400 employes.

There are so many things to be said about the attactiveness of Chicago. The lake front is internationally known for its beauty. The system of expressways, now being installed, is the most ambitious road construction project in any urban area.

Our land clearance program has caused considerable favorable comment, but there are still things that are lacking. In spite of the fact that huge sums have been spent on new activity, we haven't kept pace with the national norm in important instances.

In spite of the fact that our area possesses the largest number of research laboratories in the country, and that the machine tool industry has the greatest number of workers here, which should be a barometer of our potential industrial might and growth, we are constantly losing the city's industries in favor of the suburban region.

If it were possible for the city to grow at the same rate of growth that now exists in the suburbs, the suburban growth in turn would be even greater than it is.

Our very improvements have hurt our growth. The Wacker Drive extension, for example, meant the permanent dislocation of the needle trades.

The present growth of Wacker Drive will undoubtedly surpass the tax ability of the previous building structures, but we have lost one group of workers without replacement.

There are presently 14,000 acres of vacant land in Chicago but the greater bulk of this land lies south of Madison Street.

What makes this south side land so unattractive for future expansion?

Actually, industry has felt the area to be undesirable because of the presence of heavy industry and because the employe that they would wish to attract has moved from the city in a north and westerly direction.

The ethnic composition of the population on the south side has had very little effect upon the location of industry in this direction. With the industrial location moving in a westerly-northerly direction, home building activity on the south side has also suffered.

However, in the recent past, the north side has reached a plateau in its growth, whereas, the projection of the south side has been increasingly greater.

This heavy population growth, however, has not been accentuated as much as the amount of vacant land would indicate. This is the real source of Chicago's growth and it is being throttled, undoubtedly by the circumstances which I have outlined.

What then can be done to make this land more attractive to industry and its workers?

South Side Land

The completion of the expressway system will, of course, be an added inducement for further growth but it will not be enough. Positive measures must be taken in order to make expenditures of capital investment more attractive.

In the heart of the south side lies the great bulk of available vacant land. This land has been zoned as industrial because of its proximity to other industry and because considerable improvement is needed.

One of these pieces lying immediately adjacent to Lake Calumet would be particularly attractive if the land were improved with transportation facilities and if the adjacent industries could be induced to practice good housekeeping.

One of the things that the city found necessary in the past to make an area attractive was the establishment of parks for recreational purposes.

The time has come where it is equally necessary for the city to establish parks for industry. This is no loose projection of thought.

During the past two years, in the most depressed period of industrial expansion since World War II, the only area that showed considerable industrial activity was in Centex Park located immediately west of O'Hare Field.

In this period of little activity elsewhere, Centex was able to offer industrial park facilities, thereby practically cornering the market on industrial prospects seeking such facilities.

This same activity could be duplicated at these large expanses of land lying to the south of Lake Calumet.

However, the only competent authority to push a plan of this magnitude would be the city itself. There is no reason why this couldn't prove to be a worthwhile profitable enterprise.

The city's authority would establish a reputation for the park. The city, having once established the enterprise, could turn this operation over to private enterprise much as the parking garages are now handled.

An area of upwards to 1,000 acres established in the heart of the potentially fastest growing region in the country, and the only one that could offer adequate utilities in unlimited amounts, would be assured of success from the very start.

A successful venture of this type would mean the remaking of the whole south side.

There are many local improvement groups in the city and their fields of activity frequently over-lap; but they are basically interested in their own immediate welfare. It would require the power of the city itself to take on this activity.

The subject of industrial development is now playing a vital role in the economy of each community in the nation. We have completed an era in which the competition for these plants has been mild compared to what we expect in the future.

The challenge of plant location requires the cooperation of all. The butcher, the baker, the candlestick maker are all involved.

All of northern Illinois is the happy hunting ground for those who would insidiously persuade our normal growth to come to their area of the country.

Make no mistake—we need no crystal ball to see our immediate benefits. They are for us to see right now . . . the specifications for an actual industry.

Babcox & Wilcox Now Shipping Atomic Fuel for N. S. Savannah

Initial shipment of nine million dollars worth of nuclear fuel elements which will power the N. S. "Savannah," world's first atomic merchant vessel, was made recently by The Babcock & Wilcox Company's Lynchburg, Va., nuclear facilities.

In all, 36 fuel elements will be delivered. Four of the elements will be "spares," while 32 will be assembled as the reactor "core," capable of propelling the "Savannah" 14 times around the globe, or 350,000 miles, without stopping. A ship powered by more conventional means would require 800,000 barrels of fuel oil to travel the same distance.

Each element weighs 760 pounds, and is 92 inches long and 8.5 inches square. A single element contains 164 stainless steel tubes one-half inch in diameter, which contain the nuclear fuel in pellet form.

There will be 682,000 uranium oxide pellets in the reactor core, bearing 15,620 pounds of U235 and U238. Of this, 127.6 pounds, or 1.2 per cent of U235, the fissionable isotope, will be consumed before replacement by a new core is necessary. In effect, the "Savannah" will travel on approximately two fuel pellets per mile.

The vessel measures 596 feet long, 78 feet in beam, and will cruise at about 20 knots when it begins operating in 1961.

Steel Founders Society To Observe Centennial

The steel casting industry, through its national association—The Steel Founders Society of America—is observing its centennial this year. The first steel castings to be poured in the United States were railroad parts made by the Buffalo Iron Works—now Pratt & Letchworth Div. of the Dayton Malleable Iron Co.—in 1861. Today the steel casting industry has an annual capacity of 2½ million net tons and employs more than 50,000 in 240 commercial steel foundries.

RUSSIAN RAILROADS MAKING PROGRESS

. . . but far behind U. S. in capacity and equipment

Even if some Americans don't think too highly of U. S. railroads, the Russians do. "The basic concepts of the United States have been largely adopted in Russia. Progress in this country is carefully watched by Soviet technicians," a railroad executive said in New York on Dec. 1.

William M. Keller, vice president, research, Association of American Railroads, Chicago, Ill., told the Winter Annual Meeting of The American Society of Mechanical Engineers that Soviet rail equipment, while not up to U. S. standards, is improving. His observations were based on a recent inspection to the U.S.S.R.

New Soviet freight cars are essentially the same as U. S. models, said Mr. Keller. But figures for total car capacity are elusive. "The Russians do not furnish outsiders with such figures." He listed a guess of 1.3 million cars on the Soviet equipment list.

Automatic car coupling, similar to American designs, is seen increasingly, Mr. Keller continued.

Soviet passenger cars differ quite a bit, however, from their American counterparts. Only a few have soft seats for daytime travel and air conditioning is just in the experimental stage, Mr. Keller said. If you want air, you open a window. "All passenger carrying cars designed for long distance travel are equipped for utilization as sleeping cars, with few exceptions. They are provided with either soft or hard seats, with backs or shelves that can be raised and used for sleeping purposes. Hard seats are of wood construction without any cushions or upholstery. Soft seats have cushioned upholstery and back rests."

Mr. Keller continued, "Safety glass is not generally used and the glass in car windows is of such quality that from many of the windows, the view is distorted by the imperfections in the glass."

In the locomotive field, steam power still predominates, although the Russians are rapidly converting to electric or diesel electric power. Most of their diesel design is based on western counterparts, Mr. Keller reported. The Soviets are also buying French and German locomotives.

As far as rumors of nuclear powered locomotives go, they seem unfounded, he said. "The potential use of nuclear power so far as the railroads are concerned would be in its application to generating of electricity in central power stations."

The Russians staff their railroads mainly with graduates of the state's railroad technical institutions. Women are employed extensively, said Mr. Keller. "It is difficult for a graduate to change his field after taking a course in some phase of railroad work. However, there is little incentive to change since railroading in the Soviet is a prestige industry, provides for travel and is generally at higher pay rate than most of the other industries." He cited the bonuses employes can receive for economy in the use of fuel and the better living quarters and higher salary officials can achieve for overfulfillment of their particular goals.

The Russians are a long way from catching up to the United States in capacity or equipment, however, Mr. Keller went on. Propaganda posters he saw portrayed the Russians as passing the United States in 1965, which he does not think will be the case. "The Soviet government is not sparing manpower, money or laboratory equipment to promote research and development for railroading. The program is more extensive than that of any other single railroad system. However, the success of any program must be measured by results. Compared to the United States, the U.S.S.R. is still behind, but progress is being made.

Portable elevators are just the thing for do-it-yourself maintenance men. *Electrical Construction and Maintenance* reports that you can now get a push-button scaffold which rises automatically to a height of 20 feet.

Batteries as well as bullets are now going into target pistols. As reported by *Product Engineering*, a target pistol which has a battery operated trigger is now being used by the Army.

Gilbert-Hodgman, Inc.

Electrical Engineers and Contractors

1625 W. 75TH PLACE

CHICAGO 20, ILLINOIS

Members W. S. of E. and A.I.E.E. TRiangle 4-7540

Hinged Sheets of Welded Wire Fabric Save Time

The use of *hinged* sheets of welded wire fabric for slab reinforcement saved time and money in construction of the seven-level Mall Park Garage this fall in downtown Dayton, Ohio. The reinforced concrete structure, which is essentially a continuous square spiral around the perimeter of the building, upon which cars ascend and are parked, is mainly of poured concrete pan-and-joist construction. Sheet metal pans form voids in the concrete slab's underside, thus reducing the slab thickness over the plan to three inches. The space between the pans forms reinforced concrete joists.

Structural and temperature reinforcement of the thin concrete slab over the pans is afforded by welded wire fabric, style 6 x 12—¼-¼. The six inch spaced ¼ inch diameter wires were placed *across* the pans in the direction of design stress and the 12 inch spaced wires were placed parallel to the pans, mainly for crack control.

The fabric was delivered to the job in sheets 16 feet long and 9½ feet wide, with this width being broken by a hinge along a near-center longitudinal wire so that the sheet folded down to a five foot width. Thus, for handling purposes, the sheets were 16 x 5, and therefore could be trucked through Dayton's streets without overhang problems or special permit, could be crane lifted onto the working deck in bundles of thirty, and the sheets then placed in position over the pans by only two men.

Indicative of the time-saving advantages of the hinged sheets is the fact that two bundles of hinged sheets were placed for a 9000 square feet plus area (or about one quarter of a floor level in the garage) in little over half a day. It is estimated that placement and tying of individual reinforcement for the same area by the same crew would have taken nearly three times as long.

The reduced handling and handling time of the hinged sheets were reflected in lower bids by the steel placing subcontractor, and thus money was saved for the general contractor and the owner.

(Wire Reinforcement Institute, Washington 4, D.C.)

IS IT THE PROPER THING TO DO?

NOTE: This column deals with standards of conduct in the engineering field. The editor invites comments and criticisms on the ethical problems considered herein. Questions submitted on engineering ethics will be given careful attention. You should address your letter: The Editor, Midwest Engineer, 84 E. Randolph St., Chicago 1, Ill.

SITUATION: An engineer proposes constructing a sewage plant for treating sewage from a given area. The engineer goes to an owner of real estate in the area and suggests that the owner of the real estate be willing to have his area drain sewage into the proposed sewage treatment plant. The engineer's promotion of the sewage treatment plant fails when an insufficient number of real estate owners show interest in the proposed sewage treatment plant which the engineer is promoting. After the promotion fails, the engineer submits a bill to the real estate owner for engineering work done on the sewage treatment plant.

QUESTION: Is this engineer acting in an ethical manner?

REPLY: In line with the situation as stated the engineer is acting in an unethical manner. Much depends on the terms and conditions of the contract between the engineer (who in this case is also a promoter) and the real estate owner. If the agreement made at the outset stipulated that the engineer would be paid for his survey and engineering work whether sufficient numbers of real estate owners signed up to finance the project, then the engineer is within his rights to submit a bill and expect payment. If this point was not understood, then, the engineer is acting unethically to submit a bill and demand payment.*

*An opinion of the Panel on Engineering Ethics of the Division on Education and Research of the W.S.E.

West Suburban Meetings

The West Suburban Division, Chairman George S. Hall, announces two dinner programs of wide general interest.

On Wednesday, February 8th—"Pipelining in Our Own Backyard," will cover the interesting story of the new 73 mile, 30" diameter pipeline from Troy Grove, Illinois to a point near LaGrange, Illinois. This line will bring gas during the heating season from summer storage in underground sand formations to the suburban area. Mr. George Long, of Northern Illinois Gas Company, project engineer in charge of construction and a fine speaker, will present the program using slides and movies. Mr. Harold Schwalm, superintendent of storage, will assist.

The meeting on Wednesday, March 8th, will present "The Volkswagen Story." Mr. Daniel Zinn, formerly an engineer with the Bell Telephone Laboratories and the Western Electric Company, now with the Volkswagen organization will tell of his visit to the Volkswagenwerk at Wolfsburg, Germany. His talk, illustrated with color slides will describe the organization, facilities, manufacturing procedure and quality control aspects of the organization.

THE MONADNOCK
53 West Jackson Blvd.
Chicago 4

LONG RECOGNIZED AS
Headquarters for Office Space
FOR
Engineers
Architects
Patent Attorneys
Manufacturers'
Representatives

ALDIS & COMPANY Management

A nationally-known business address

Cloud Seeding Theory Inadvertently Dispelled

Two scientists at Illinois Institute of Technology, Dr. L. F. Mondolfo and Dr. B. E. Sundquist, working on an unrelated problem in metallurgy under a National Science Foundation grant, discovered that the generally accepted scientific explanation for silver iodide cloud seeding—known popularly as rainmaking—is not correct.

Before water vapor floating in the atmosphere can precipitate, it must first be transformed into ice. The two Illinois Tech scientists found that rainmakers have been using the right substance for this transformation, but for the wrong season.

Scientists have generally accepted in the past that because silver iodide's crystal structure is similar to ice, it provided a good nucleus around which the solidifying ice could form. According to Mondolfo and Sundquist, silver iodide serves as a good nucleus because its surface energy is higher than ice, not because of similar crystal structure. Therefore, the material to be nucleated (ice), has a surface energy lower than the nucleus (Silver iodide), and will form a coating on it.

A liquid or vapor can be subjected to temperatures below the freezing point, but will not solidify unless a nucleus is present upon which the solid can form. For example, water in large amounts is found in the atmosphere at temperatures as low as —40 degrees Fahrenheit, and when seeded with silver iodide, it immediately freezes and precipitates.

The research of the two scientists theorized that the similarity of crystal structure is not at all important. Working with metals in their study of "Heterogeneous Nucleation in Liquid Metals," they found in all cases that where one metal could act as a nucleus for another metal, the reverse is impossible. For example, according to Mondolfo, "Tin will act as a very good nucleus for lead, but will not act as a nucleus for tin at all."

Because of the success achieved in the research project at IIT, the National Science Foundation has granted another award of $26,400, for three years of further study. The research is directed at the determination of the factors that control the nucleation, and the establishment of a theory of nucleation to replace the discarded one.

Chicago's Engineers' Week Banquet – Feb. 23rd

National Engineers' Week will be observed February 19-25, sponsored by the National Society of Professional Engineers.

A feature of Chicago activities in this event will be the Chicago Engineers' banquet. It will be held at McCormick Place, Lakefront Banquet Hall, 23rd St. and Outer Drive, Thursday, February 23rd. Dinner at 6:00 P.M.

Program will feature Engineer of the Year Award. "Man Into Space" will be the subject of discussion by Charles J. Baker, Jr. Mr. Baker is Deputy Chief, Future Projects Design Branch, George C. Marshall Space Flight Center, National Aeronautics and Space Administration.

Tickets $6.00 per person. Information available from Chairman H. Hansen, 922 Sherwood Drive, LaGrange Park, Ill. Office Phone RAndolph 6-3451.

S&W Electric Co. Buys Land, Building to Expand Plant

S&C Electric Company has acquired a 33,000 sq. ft. building and two acres of land adjoining its manufacturing and laboratory facilities here at 6601 N. Ridge Avenue. The company plans to modernize the structure. It will be used for manufacturing and as a warehouse.

S&C is a leading manufacturer of high-voltage switchgear for electric utilities, industrial plants, and commercial buildings.

Company president John R. Conrad said the purchase was made to "help insure future company growth." The property is immediately north of the company's present 117,000 sq. ft. manufacturing plant and its $2 million laboratory now nearing completion.

Maurice W. Casad Dies Suddenly; Was Illinois Bell Engineer, WSE Treasurer

Maurice W. Casad, suburban area chief engineer for the Illinois Bell Telephone Co., died December 7th of a heart attack. He was stricken in Northwestern Station on his way to catch a train to his home in Wilmette. A well-known member of WSE, he joined the Society in 1936. He served as its treasurer from 1945 to 1947 and was active on numerous committees. He was 57.

He started with IBT as a student engineer in 1924, the year he graduated from Kansas State University with a bachelor of Science Degree in civil engineering.

During his 36-year career with IBT, he served as engineer in charge of real estate, plant extension engineer, and equipment and building engineer. In 1950, he was granted a temporary leave to serve as assistant deputy director of communications for the Illinois State Office of Civilian Defense. Mr. Casad was named general plant engineer in 1952 and assistant to the comptroller the following year. He had been chief engineer since 1955.

POLE TREATING COMPANY

Contractor

for

Extending life of poles

in plant

412 N. Milwaukee Ave. **Wheeling, Illinois**

Professional Directory

Battey & Childs, Inc.

ENGINEERS — ARCHITECTS
231 So. LaSalle Street
Chicago 4, Ill.

INDUSTRIAL PLANTS
POWER PLANTS
REPORTS

DESIGN SUPERVISION

Chas. W. Cole & Son

Engineers & Architects

South Bend, Indiana

A. A. Lipsey & Associates

ARCHITECTS & ENGINEERS

Licensed in Arizona, Illinois, Wisconsin, Minnesota, Delaware, South Carolina, Pennsylvania, Indiana, Georgia, Alabama

Structural Design
Industrial Buildings
Commercial Buildings
Foundations
Investigation
Reports — Appraisals

108 W. LAKE ST. CHICAGO 1
Financial 6-7314

HAZELET & ERDAL

Consulting Engineers

Bridges — Foundations
Expressways — Dams — Reports

Monadnock Block
Chicago

403 Commerce Bldg., Louisville
Dixie Terminal Bldg., Cincinnati
Oding Bldg., Lansing

ROBERT W. HUNT COMPANY
ENGINEERS

Inspection • Tests
Consultation
•
Engineering Materials
•
Cement • Concrete • Chemical
Physical and Metallurgical
Laboratories

810 S. Clinton St., CHICAGO 7. And All Large Cities

Alvord, Burdick & Howson

ENGINEERS FOR

Water Works, Water Purification, Flood Relief, Sewerage, Sewage Disposal, Drainage, Appraisals, Power Generation

20 N. Wacker Drive • Chicago 6

Telephone: CEntral 6-9147

STANLEY ENGINEERING COMPANY

Consulting Engineers

Hershey Building
Muscatine, Ia.

208 S. LaSalle St.
Chicago 4, Ill.

1154 Hanna Building
Cleveland 15, Ohio

SOIL TESTING SERVICES, Inc.

Consulting Engineers

John P. Gnaedinger
Clyde N. Baker, Jr.

Soil Investigations,
Foundation Recommendations and Design,
Laboratory Testing

1827 N. Harlem Avenue, Chicago 35, Illinois
Milwaukee, Wisconsin - Portland, Michigan
Kenilworth, N. J. - San Francisco, California
Havana, Cuba

GREELEY AND HANSEN

ENGINEERS

Water Supply, Water Purification

Sewerage, Sewage Treatment

Flood Control, Drainage, Refuse Disposal

14 East Jackson Boulevard, Chicago 4, Illinois

VERN E. ALDEN CO.

Engineers

Engineering — Design
Supervision of Construction

Industrial and Chemical Plants
Steam Power Plants

33 North LaSalle St.
Chicago 2

CONSOER, TOWNSEND & ASSOCIATES

— Consulting Engineers —

Sewage treatment, sewers, storm drainage, flood control — Water supply and treatment — Highway and bridges — Airports — Urban renewal — Electric and gas transmission lines — Rate studies, surveys and valuations — Industrial and institutional buildings.

360 EAST GRAND AVENUE
CHICAGO 11, ILLINOIS

SARGENT & LUNDY
ENGINEERS

Consultants to the Power Industry

• STUDIES
• DESIGN
• SUPERVISION

140 South Dearborn Street, Chicago 3, Ill.

Your Card* in this Professional Directory will acquaint others with your specialized practice.

* Restricted to Professional Architects and Engineers

Use of Index Numbers Topic of First Management Program

"Index Numbers as Tools of Modern Management" will be the subject of the Management Division's first sponsored program in the Wednesday luncheon series on February 8, 1961. The speaker will be A. F. Birmingham, an American Telephone and Telegraph Company executive in Springfield, Illinois. He has made an extensive study of the philosophy, preparation, and use of index numbers in business and industry. Once considered mere statistician's yardsticks, Birmingham will show how index numbers have become one of Management's most powerful tools in dealing with the complexities of modern business operations. This should be one of the liveliest programs of the year, says Wm. V. Sayner, who is making arrangements for the meeting. A distinguished group of engineering and business executives will be at the speaker's table.

The second Management Division program will be in April when Hjalmar W. Johnson, Vice President, Planning and Research, Inland Steel Company, will present some of his and Inland's experiences in on-the-job development of engineers for Management positions. The Inland Steel Company has a reputation as one of the steel industry's best managed operations. Watch for the date in your next luncheon card announcement.

The new Management Division of W.S.E. came about as the result of a luncheon talk on November 9, 1960, by R. H. Bacon, President of R. H. Bacon and Company, on the subject "Engineering Management Moves Ahead." He showed a movie he took in Australia while attending the 12th International Congress for Scientific Management at Sidney and Melbourne as a delegate for A.S.M.E. He pointed out the need for a Management Division in W.S.E. that could also cooperate with the other engineering groups in conducting Management conferences and occasional luncheon programs. A petition was circulated after Bacon's talk and signed by enough members for presentation to the Board of Direction. The Board on December 10 approved the formation of the Division, and during the course of this Society Year its organization will be completed.

As pointed out by Bob Bacon, sound engineering Management from both a personal and organization standpoint begins with the sheepskin and continues to Social Security. In his opinion many engineers do not accomplish as much in their careers as they should because of a lack of Management "know-how." W.S.E. will perform a valuable service to engineers by providing a forum for this "know-how."

In the past few years the luncheon programs have become an important feature of W.S.E. membership. The luncheons are doing for engineering what the Executive Club luncheons are doing for business. George C. Harris, Chairman of the Luncheon Committee, has developed programs which are drawing attendances at the highest average level in the Society's history. He urges every member make an effort to attend as many as possible. The speakers are good. A good turnout encourages and makes feasible signing up more good programs.

•

1960 Consumption of Nickel Up 15% over 1959

Consumption of nickel by the free world will set a new high annual record in 1960, exceeding 500,000,000 pounds, an increase of over 15 per cent above that of 1959.

A substantial increase in the use of nickel in Europe, was the main contributing factor to the free world's record-breaking consumption during 1960. Differing from the pattern of past years, total consumption in North America, which for many years has been the world's largest market for nickel, was below that of the balance of the free world.

For the year 1960, the geographical distribution of the free world's consumption of nickel by areas is estimated as follows: Europe, 43.5 per cent; United States, 43 per cent; Canada, 2.5 per cent, and others, 11 per cent.

Nickel Applications

"All markets for nickel advanced during the year, with the use of nickel in stainless steels showing the greatest gain. A substantial increase was also registered for the application of nickel in electroplating, mainly as a result of the use by the automotive industry of improved techniques, permitting higher quality nickel plating.

"Following is an estimate of free world nickel consumption in 1960 by fields of use:

Field:	*Percentage of Total:*
Stainless Steels	32%
Electroplating	16%
High-Nickel Alloys	15%
Nickel Alloy Steels	13%
Iron and Steel Castings	12%
Copper and Brass Products	4%
All others	8%
	100%

TELEPHONE OLympic 2-6500

A. A. Electric Company

CONSTRUCTORS OF ELECTRICAL HIGH LINES AND POWER SUBSTATIONS

3125 SO. 60TH COURT, Cicero 50, Illinois

Nickel producers of the free world continued to increase their production capacities in 1960 and it is estimated that before the end of 1961 the total nickel production capacity of the free world, exclusive of Cuban sources, will approach 600,000,000 pounds annually. Canada will account for more than three-quarters of the free world's total nickel production capacity in 1961. International Nickel's new project at Thompson, Manitoba, which is rapidly nearing completion, will contribute substantially to the anticipated increase in the nickel production capacity of the free world.

A new nickel alloy steel developed by International Nickel for use at very low temperatures was recently demonstrated jointly by Inco, Chicago Bridge & Iron Company, and United States Steel Corporation in a technical testing program called "Operation Cryogenics." This alloy steel is expected to find widespread use throughout industry for the storage and transportation of liquefied gases at temperatures as low as minus 30 degrees Fahrenheit.

Professional Directory

LESTER B. KNIGHT & ASSOCIATES, Inc.

EVIDENCE OF EXPERIENCE

- Management Engineering
- Industrial Engineering
- Plant Engineering

CHICAGO

DE LEUW, CATHER & COMPANY

CONSULTING ENGINEERS

Public Transit — Subways
Traffic & Parking — Railroad Facilities
Expressways — Industrial Plants
Grade Separations — Municipal Works
Urban Renewal — Port Development

150 North Wacker Drive, Chicago 6

San Francisco — New York — Boston

E. R. GRITSCHKE and ASSOCIATES, Incorporated

Consulting Engineers

Designers of
MECHANICAL and ELECTRICAL SYSTEMS for BUILDINGS

11 S. LaSalle St., Chicago 3, Ill.

EDWARD J. WOLFF & ASSOCIATES

ELECTRICAL . . .
MECHANICAL . . .
CONSULTING ENGINEERS

300 WEST WASHINGTON STREET
CHICAGO 6, ILLINOIS

◆

LAND SURVEYS

INDUSTRIAL · COMMERCIAL · RESIDENTIAL

LEGAL DESCRIPTIONS
PROPERTY LINES —
RIGHT OF WAYS —
SUBDIVISIONS —
TOPOGRAPHY —
CONSTRUCTION LINES—GRADES

S. PASQUINELLI
REG. ILL. IND. WISC.

NATIONAL SURVEY SERVICE, INC.
Registered Engineers and Land Surveyors
134 NO. LA SALLE ST. · RAndolph 6-7608

◆

JENKINS, MERCHANT & NANKIVIL

Consulting Engineers

Municipal Improvements — Gas Systems
Highways & Airports — Water Systems
Power Development — Sewerage Systems
Traffic Surveys — Industrial Plants
Flood Control — Recreational Facilities

Investigations and Reports

801-805 East Miller St. — Springfield, Ill.

ESTABLISHED 1913

WALTER H. FLOOD & CO.

CHEMICAL ENGINEERS

Inspection and Testing
Of Materials and Structures
Buildings, Roads, Streets, Airports
SUPERVISION OF CONSTRUCTION
CONCRETE CORE CUTTING —
SOIL BORING

6102 S. BLACKSTONE AVE. — CHICAGO 37
Branch — 3422 E. Cork
Kalamazoo, Mich.

Your Card* in this Professional Directory will acquaint others with your specialized practice.

* Restricted to Professional Architects and Engineers

News of Engineers

or: Personals of Personable People

Two of the highest honors in engineering were presented in New York on Dec. 1 at the Winter Annual Meeting of The American Society of Mechanical Engineers.

Henry T. Heald, Western Society past president and president of the Ford Foundation, became an Honorary Member of ASME, and Professor Carl R. Soderberg was awarded the ASME Medal. The presentations were made during the Society's banquet at the Statler-Hilton Hotel.

Honorary Membership, oldest award the Society bestows, is given for effective and faithful service rendered to the Society, to the engineering profession, or to the public.

The ASME Medal is awarded for distinguished service in engineering and science.

Henry T. Heald became president of the Ford Foundation in 1956. For the preceding twenty-nine years, he had made his career in American higher education, serving as president of the Armour Institute of Technology, Illinois Institute of Technology and chancellor and president of New York University.

Besides his teaching activities, Mr. Heald has also been active in civic and industrial affairs. In Chicago, he was chairman of the Mayor's Committee which investigated and instituted reforms in the city school system, of the South Side Planning Board and president of the Citizens' Building Code Committee.

C. R. Soderberg joined the Massachusetts Institute of Technology staff in 1938 as professor of Applied Mechanics. He became, successively, Professor of Mechanical Engineering, Head of the Department, Dean of the School of Engineering and Institute Professor.

He has always been interested in turbine and generator design, dynamics and vibrations. During World War II, Dr. Soderberg worked with various divisions of the National Defense Research Committee.

•

Meissner Engineers, Inc., Chicago, has announced the election of Edmond A. Siebert, Jr., to the new position of vice president in charge of sales.

In announcing Siebert's election as an officer of the company, WSE member *Robert C. Meissner*, president, said the position had been created as another step in the firm's expansion program, to further increase coordination of sales efforts between MEI's various divisions and to focus executive responsibility on the company's accelerating client service activities.

Siebert had been sales coordinator of the organization. In the four years since joining MEI, he had worked largely in the areas of processing and materials handling, with clients in the minerals and chemical fields.

A former plant engineer and plant superintendent for F & F Laboratories and M. J. Holloway & Co., he is a registered professional engineer and mechanical engineering graduate of Northwestern University, who also studied engineering at Cornell University and the United States Naval Academy.

•

John R. Cooper has been named sales engineer covering central Illinois, southern Michigan, and northern Indiana for S&C Electric Company, according to WSE member *John R. Conrad*, president. Mr. Cooper was with Allis-Chalmers Manufacturing Company in Milwaukee and Chicago for ten years.

S&C is a leading manufacturer of high-voltage switchgear for electric utilities, industrial plants, and commercial buildings.

Mr. Cooper received a Bachelors Degree in electrical engineering from Kansas State University in 1949. He is an associate member of American Institute of Electrical Engineers, and belongs to Western Society of Engineers,

•

Marvin C. Mertz, 32, of 3001 South Parkway, has been appointed an instructor of physics on the faculty of Illinois Institute of Technology, it was announced recently by IIT president (and WSE past president) *John T. Rettaliata*.

Immediately before his appointment at Illinois Tech, Mertz was an assistant professor of physics at Valparaiso University. He was also an instructor of physics at the University of Conn., Waterbury, and an electronics instructor while serving in the Navy.

Mertz received a B.A. degree from Kalamazoo College (Mich.) in 1951, and was awarded an M.S. degree at Yale University in 1958.

ASPLUNDH

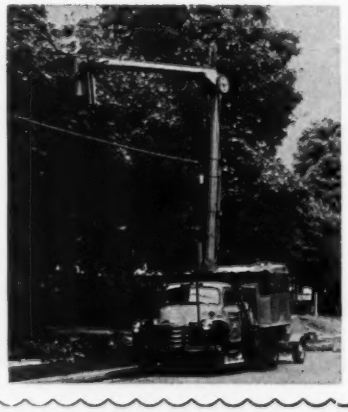
Effective and Economical

LINE CLEARANCE

and Right-of-Way work

Opening of new rights-of-way, and trimming of trees and chemical brush control on existing rights-of-way are operations which should be entrusted only to specialists.

412 N. Milwaukee Ave.
Wheeling, Illinois
Attention, Mr. Earl Reynolds



Sargent & Lundy, Chicago consulting engineers, announce the year end appointment of William A. Chittenden and Tor D. Kolflat as Associates in the firm. Chittenden is a member of the firm's nuclear engineering staff, and Kolflat is a member of the mechanical engineering staff. Tor Kolflat is an associate member of the Western Society of Engineers.

•

The appointment of a former Gary, Ind., engineer, J. Donald Rollins as president of American Bridge Division, effective January 1, was announced today by Austin J. Paddock, administrative vice president—fabrication and manufacture, United States Steel Corporation.

A native of Pittsburgh, Rollins attended Carnegie Institute of Technology and Armour Institute of Technology. He joined U. S. Steel Corporation in 1934, with the American Sheet & Tin Plate Company, as an estimator. He has held various engineering positions including chief engineer—Gary Works; assistant chief engineer for Carnegie-Illinois, a former subsidiary company; assistant chief engineer — manufacturing, U. S. Steel; and assistant vice president—engineering for the Corporation.

Starting in 1955 he was vice president —engineering for American Bridge Division. Returning to the Corporation in 1958 as vice president—facility planning, he was appointed to his present position of vice president — facility planning and appropriations on March 1, 1960.

The appointment of Austin J. Paddock, formerly of Gary, Ind., as administrative vice president—fabrication and manufacture, United States Steel Corporation, effective January 1, was announced today by E. H. Gott, executive vice president—production.

In his new responsibility, Paddock will be in charge of the American Bridge Division, Consolidated Western Steel Division, Universal Atlas Cement Division and United States Steel Homes Division of United States Steel.

Paddock was born in Washington Court House, Ohio, attended Eastern High School in Detroit, Michigan, and was graduated from the University of Michigan with a B.S. degree in civil engineering in 1929.

Upon graduation he began work with American Bridge as a timekeeper in the construction department. One year later, he was transferred to the drafting department. Two years later he became plant rate clerk and industrial engineer. In 1934, he was appointed assistant to the manager of the Bridge company's Elmira, N. Y., plant and in 1937, advanced to plant manager. In 1941, he was transferred to the Gary, Ind., plant where he was manager for five years.

He was vice president—manufacturing operations from 1946 until his appointment as vice president — contracting in 1954. He became president of American Bridge on July 1, 1956.

•

Niels C. Beck, 48, has been appointed assistant director at Armour Research Foundation, Dr. Haldon A. Leedy, ARF director, has announced.

Beck succeeds Dr. Christopher E. Barthel, Jr., who has resigned effective January 1, to become program director for international activities of the National Science Foundation, Washington, D. C.

Beck has served as director general of the Union of Burma Applied Research Institute, an ARF project, for the past four years. He became associated with the Foundation in 1953 as a staff member of the program development office, and later served as acting manager of it.

He is a former dean of Parks College, St. Louis University, and his fields of interest have included accounting, transportation, economics and meteorology. Beck is a native of Denver, Colo., and received his A.B. and B.S. degrees in chemistry at Regis College, and did graduate work in geophysics at St. Louis University.

Barthel became associated with ARF in 1947 as assistant director of physics research. He headed physics research activities in 1948-50, and then spent three years creating, organizing and directing ARF's personnel department. In 1953 he went to Burma to establish and serve as Director General of the Union of Burma Applied Research Institute.

For the past four years Barthel served as assistant director of ARF in the areas of Foundation policy, sponsor relationships, international programs and public relations activities.

•

H. A. Sawyer, chairman of the Board and president of Lone Star Cement Co., New York, N. Y., has been elected chairman of the Board of Directors of the Portland Cement Association. Mr. Sawyer was named to the chairmanship at the closing session of the national Association's 1960 Annual Meeting in Chicago on Nov. 16.

Mr. Sawyer, who succeeds Cris Dobbins, president of Ideal Cement Co., Denver, Colo., as chairman, has been actively engaged in Association affairs for several years, serving as a member of the Board of Directors since 1955.

•

Robert C. (Bud) Meissner was the subject of a feature article in a recent issue of the Chicago *Sun-Times.*

FRED L. NELSON OF DAYTON, OHIO

Line Clearance for Public Utilities

Home office —
1014 Gem City Savings Bldg.
Dayton 2, Ohio

Illinois office —
1226 Black Road
Joliet, Illinois

ORIGINATORS OF DROP CROTCH AND LATERAL METHOD OF TRIMMING

Highlighting staff writer Jim Elliott's story was an illustration of a portrait in oil of Mr. Meissner, painted by Al Miller, manager of the graphic department of Meissner Engineers, Inc. It is just one of many pictures, most of them works of modern artists, that grace the walls of the establishment and contribute to an atmosphere unconventional in comparison with the usual engineering offices. In the same vein the story comments on Mr. Meissner's individualistic work habits. His office includes a massive coffee table that serves as a desk. Ringed around three sides of the table are comfortable divans.

Meissner, an active WSE member since 1960, is a graduate of Massachusetts Institute of Technology and a naval veteran of World War II. The firm, now employing a staff of 250, serves a growing number of state and municipal engineering departments. In industrial and process engineering Meissner Engineers, Inc. has worked for leading manufacturers in a variety of fields.

°

Applications

Paul J. Griebach, 15333 S. Hoyne Av.

J. R. Timberlake, Design Engineer, International Harvester Co., 7 S. 600 County Line Rd., Hinsdale, Ill.

Robert L. Burgin, Staff Planner, Stanton & Rockwell, 20 N. Wacker Dr.

Edward L. Mills, Dept. Chief-Equip. Engrg., Western Electric Co., Inc., Merchandise Mart Plaza.

G. J. Moorwessel, Resident Engineer, Campbell Soup Co., 2550 W. 35th St.

Norman P. Smith, Sales Engineer, Delta-Star Electric Div., H. K. Porter Co., Inc., 2437 Fulton St.

Morris Kurtzon, Inc., 1430 South Talman Avenue, Chicago, Illinois, has recently become a member of the Non-Ferrous Division of the National Association of Architectural Metal Manufacturers. **David Koch,** President of Morris Kurtzon, Inc., is the official representative.

The 1960 Award for the Outstanding Civil Engineer of the Year has been conferred on Carl Altgeld Metz by the Illinois Section—American Society of Civil Engineers. Presentation was made at the annual meeting of the society on December 7th at the Chicago Engineers Club. Mr. Metz, Western Society trustee, is a structural engineer and a partner in the firm of Shaw Metz & Associates, Chicago.

During his long span of private practice he has designed a wide variety of industrial, commercial and government buildings. Included in this group are two reinforced concrete circular buildings housing atomic reactors (with post tensioned roof domes); the tallest light weight reinforced concrete building in the world (36 stories), a 40-story office building in Chicago and the Chicago Exposition Building.

Mr. Metz was born in Tolono, Ill., in 1892. He attended Tolono High School and on graduation entered the University of Illinois, receiving a B.S. degree in Civil Engineering in 1912.

From 1915 to 1925 he was field engineer and structural designer for Stone & Webster, Engineers and Constructors and Thompson Starrett Co., Engineers and Constructors of concrete grain elevators; also Chief designer for Richard Griesser, industrial architect. From 1925 to 1930 he was partner in Dovell & Metz, structural engineers and from 1930 to 1947 owner of C. A. Metz Engineering Co. For some twelve years following he was partner in Shaw Metz and Dolio, architects and engineers. The present firm was founded in 1959.

As an inspiring teacher he has helped to develop many young engineers and encouraged them to take part in their societies' activities.

Included in his many active affiliations are: American Society of Civil Engineers, National Society of Professional Engineers, Illinois Society of Professional Engineers, American Concrete Institute, American Institute of Architects. In addition to being a trustee, he has served on many WSE committees. He is a past president of the Architects Club of Chicago. Presently he is serving Chicago Mayor's Building Code Committee.

The Winter General Meeting of the American Institute of Electrical Engineers, will be held Jan. 29-Feb. 3 at the Statler-Hilton Hotel, in New York.

MIDWEST FORESTRY CORPORATION

Line Clearing for Better Public Relations

Post Office Box 409

Muncie, Indiana

FEDERAL PIPE & SUPPLY CO.

900 S. CAMPBELL AVE.

CHICAGO 12, ILL.

PIPE — VALVES — FITTINGS

PIPE FABRICATION

SEELEY 3-6960

Reviews of Technical Books

Reinforced Concrete

Reinforced Concrete—Column Tables —Ultimate Strength Design, by Hugh F. Fenlon. Published by F. W. Dodge Corporation since ultimate strength design has become accepted and utilized in many structures built today, this book can well serve as a handbook for the practicing structural engineer. The introductory chapter outlines the basic formulas and derivations relating to the design concept. General design considerations such as code requirements for bar arrangements, sections and column length limitations are discussed in the following. The rest of the book is made up of tables for rectangular tied and spirally reinforced columns. These tables, in tabular form, give column section, bar arrangement, allowable axial load, combined with a safe moment for given column sizes. The presentation is clear and concise, the page edge indexed for column sizes make it expedient for the designer to use.

S.W.L.

Nuclear Technology

Modern Nuclear Technology, by Mark M. Mills, Arthur T. Biehl and Robert Mainhardt. Published by McGraw-Hill Book Company, Incorporated. New York 36, N. Y. Pages, 336. Price, $9.50.

The material contained in this book is, for the most part, a result of a series of lectures given under the Engineering Extension program of the University of California in Berkeley during the summer of 1956 and 1957. The purpose of the course was to present on a management level the fundamentals of nuclear engineering, in order to help management personnel understand some of the problems which are inherent in this rapidly growing part of our economy.

Many of the chapters are rather unsophisticated for the nuclear expert or the engineer actively engaged in reactor design or operation. Each chapter stands by itself, since it corresponds to a lecture given by an individual.

This interesting and timely survey places emphasis on the future. Also, discussed is the fact that history may record that the second half of the twentieth century saw an event even more significant than power generation from fission reactors — the achievement of controlled, self-sustaining nuclear-fusion reactions, and the eventual transition of the world's industrial economy to an almost complete dependence on nuclear fusion as its primary energy source.

A glossary of the new vocabulary of nuclear engineering is included, and every effort is made throughout to use the words in their proper context so that the non-expert may learn how to use them.

W.L.R.

Building Design Handbook

Building Design Handbook prepared under the direction of the Technical Committee-Wire Reinforcement Institute, Incorporated, Washington 4, D. C. Pages, 168. Price, $3.00.

The object of this handbook is to acquaint the architect and engineer with the advantages to be derived from the use of the broader range of fabrics now available for reinforced concrete building construction. The handbook has been divided into two sections.

The first section gives general information on the use of welded wire fabric in concrete construction. It contains the story of welded wire fabric, its overall reinforcing advantages, sections of the American Concrete Institute Building Code applicable to fabric, short span construction, typical applications (including fabric in concrete slabs resting on the ground) welded wire fabric research, and detailed information about important projects which have utilized wire fabric.

The second section is for the concrete designer and contains actual design tables with recommended welded wire fabric styles for oneway solid concrete slabs, flat slabs, tilt-up concrete wall panels, basement walls, retaining walls and square individual column footings. It also contains design coefficents for a range of steel stresses, tables of sectional areas for fabric and for estimating weight of fabric, how to detail and to order fabric and current A.S.T.M. fabric specifications.

W.L.R.

Electrical Code

National Electrical Code Handbook: Based on the 1959 Edition of The National Electrical Code. Revised by Frank Stetka, Electrical Field Service Engineer, National Fire Protection Association. Tenth Edition. 679 pages, 5⅜ x 8, 387 illustrations, 53 tables. McGraw-Hill, $8.50.

Facts on how to handle all types of electrical wiring and installation jobs in strict accordance with the latest National Electrical Code are presented in this newly-published edition of a well-known handbook. It explains rules and measurements for electrical jobs—what they mean—and how to apply them. The book follows exactly the same numbering system as presented in the code, providing easy reference to any rule. Next to the rule, in a contrasting typeface for ease of reference, is found its meaning, intent, and interpretation where applicable.

This edition was prepared under the supervision of the National Fire Protection Association, the organization that revises the National Electrical Code. Frank Stetka is the Electrical Field Engineer for this association, and is well qualified to carry on the work developed by Arthur Abbott.

Important new features in the Tenth Edition include reorganization in line with the rearrangement and renumbering of the National Electrical Code, and numerous important changes in basic requirements. The Handbook also gives modern examples of how to calculate electrical load, number of branch circuits, and size of feeders.

Engineering Societies Personnel Service, Inc.

Est. 1918

Chicago	New York	San Francisco
29 E. Madison St.	8 W. 40th St.,	57 Post Street,
ST 2-2748	WI 7-5878	SU 1-5720

THE FOLLOWING ITEMS ARE FURNISHED BY THE ENGINEERING SOCIETIES PERSONNEL SERVICE, INC., A NON-PROFIT, SELF SUPPORTING PERSONNEL SERVICE SPONSORED BY W.S.E., A.I.E.E., A.I.M.E., A.S.C.E., A.S.M.E., A.I.CH.E., S.N.A.M.E., E.S.D., E.C.S.F. REPLIES SHOULD BE ADDRESSED TO THE NEAREST OFFICE.

MEMBERS OF THE SOCIETIES SHOWN ABOVE MAY PUBLISH FREE ADVERTISEMENT ON THIS PAGE BY REGISTERING AT THE NEAREST E.S.P.S. OFFICE. A WEEKLY BULLETIN OF POSITIONS OPEN IS AVAILABLE BY SUBSCRIPTION AT $4.50 A QUARTER.

PLACEMENT FEES: THE SERVICE IS OPERATED ON A CO-OPERATIVE BASIS, WHEREBY THOSE ACTUALLY PLACED IN POSITIONS BY THE SERVICE PAY A FEE IN ACCORDANCE WITH THE ESTABLISHED PLACEMENT FEE RATES, WHICH IS 6% OF THE ANNUAL SALARY TO MEMBERS AND 7% OF THE ANNUAL SALARY TO NON-MEMBERS.

POSITIONS AVAILABLE

This page is published to implement the intent of the James H. Brace bequest.

C-8282 (A) SR. REGIONAL ENGR. Grad. CE or Struct. To be resp. for Chgo. office operations incl. No. Ill. & Ind. doing promotional field work in uses of struct. steel. Should be able to discuss design problems encountered in struct. steel. Must be interested in promotional work & present subject as well, sal. open. (B) REGIONAL ENGRS. req'mts. as above, territories: Ky., Nebr., Hdq. Omaha incl. western Iowa, Nebr. & Wyo., Colo. & Western Kans. Minneapolis incl. Minn., No. & So. Dak., Eastern Mont. & Western Wisc. Should be registered struct engr. or able to obtain license, sal. open for a trade assoc., employer will negotiate the fee.

C-8384 CHIEF COST ESTIMATOR Grad. Mech. or equiv. in exper. age to 40; 10+ yrs. exper. in estimating light & heavy sheet metal as well as welding. Company mfgrs. heavy & light sheet metal products for railroad eqpt. & steel roof decks sal. abt. $8400 dep. on exper. loc. Calumet Area, employer will pay the fee.

C-8371 (B) SALES ENGR. Some college, age to 35; Selling worm gears & speed reducers & power transmission eqpt., travel, car req'd., sal. $7200/9600 loc. Chgo., employer will negotiate the fee.

C-8356 PLANT MAINT. ENGR. Grad. ME, CE or EE age to 45; To inaugurate at office level maint. program for multi-plant operations involving budget maint., preventive maint. programs, etc. for process industry. Will be indoctrinated in company's policy for abt. 2 yrs. in Chgo. then assigned to a district as area maint. supv. Must have good personality sal. $9/13,000 dep. on exper., loc. Chgo., employer will negotiate the fee.

C-8048 JR. PROJECT ENGR. Grad. Mech. or equiv. 1+ yr. exper. in design of light eqpt. Duties: Under direction of Sr. Project Engr. will work as liaison between engrg. & production depts., abt. 50% of time on board designing light & medium eqpt. Will work in lab. & some contact with vendors. Should be U.S. Citizen, for a mfr. of graphic arts eqpt., sal. to $7200, loc. No. Shore Chgo. Suburb, employer will negotiate the fee.

C-8140 (A) SR. MECH. DESIGN ENGR. Grad. ME age to 45; 5+ yrs. exper. with consultant or process industry. Duties: Installation & plant layout of mech. processing eqpt., htg., vent. & air cond. eqpt. Selection of eqpt. for new construction & major remodeling work. Background in chem. or food processing plant essential, sal. abt. $11,000 (B) SR. ELECT. ENGR. Grad. Work as above except from elect. end. sal. abt $11,000 loc. Chgo., employer will pay the fee.

C-8410 DESIGN ENGR-DRAFTSMAN 3-4 yrs. exper. on heating, vent., air cond., plumbing & piping. All board work sal. to $7800, loc. Chgo., employer will negotiate the fee.

ENGINEERS AVAILABLE

SALES ENGR. BSME+ age 41; Sales mech. eqpt. & anti-erection bearings; installation of eqpt. in customers' plants —production of internal combustion engines—work in foundries machine shops, inspect. assembly & test. Sal. $8,000 MW-313

ELECT. DESIGN SUPV. PLANT ENGR. BSEE P.E. age 33; 10 yrs. design, supv. & other engrg. exper. in indust. & elect. utility elect. systems, especially process controls, instrumentation, protective relaying, motor application & control & in compressors, pumps, hydraulic material handling eqpt., defense contracts; sal. $10,000, loc. U.S. or Foreign. MW-322

DESIGN & DEVEL. ENGR. BSME age 38; 10 yrs. design & devel. of diesel engines. Sr. project engr. sal. $10,000, loc. Midwest or West. MW-327

METALLURGICAL ENGR. BS-MET. Engr. age 36; 3 yrs. cast shop. met. brass rolling mill plus 5 yrs. met. & plant mgr. alum, green sand fdry. & 1½ yrs. sales engrg. ferrous castings make up exper. very adaptable to specific needs, sal. $8400. MW-334

RESEARCH & DEVEL., PRODUCTION SALES OR MGMT. Ph.D. Inorganic chem. age 51; 23 yrs. exper. in refractory metals & lanthanides, incl. powder metallurgy, vacuum, hydrogen & arc-casting techs. Product devel., alloy production & engrg. Exper. in design, sales service, cost & quality control. MW-339

METALLURGICAL ENGR. BS-Chem. Eng. age 54; Tech. & production mgmt. in ferrous & non-ferrous metal fabrication, processing & assembly. Sal. $11,400. MW-341

More Than 50 Research Laboratories Working On Fuel Cell Projects

Although fuel cells were first reported in 1802 and the first successful one was made in 1839, interest in this means for creating electricity is just now at its height, with more than 50 industrial, university and government research laboratories working on the problem.

So reported Sidney J. Magram, of the Army Research Office, Washington, in a paper, Fuel Cells, presented at the opening of a symposium on Dec. 6 in Washington, D. C. during the 53rd Annual meeting of the American Institute of Chemical Engineers.

Popular usage has broadened the term fuel cell "so that it may be defined as an electrochemical device in which part of the energy derived from a chemical reaction is converted to electrical energy by a continuous supply of chemical reactants . . . A fuel cell is a battery wherein the reactants are continuously fed to the electrodes regardless of the chemical reaction involved.

Hydrogen is the fuel and oxygen or air is the oxidant for the most successful fuel cell to date, he said.

Fuel cell reactants may be hydrogen, carbon monoxide, coal, natural gas, ethane, propane, formaldehyde, alcohol, hydrazine, zinc, sodium or magnesium, he said. Oxidants are oxygen, air, chlorine, or nitro-organic compounds.

Mr. Magram said that the largest multicell power package today is "the outstanding development of the Allis-Chalmers fuel cell powered tractor," which has 1,008 cells with an overall energy density of 170 lb/KW and 1.75 ft/KW. "It was reported that the fuels consisted of three gases, chiefly propane," but no data was disclosed indicating that the propane was oxidized to carbon dioxide and water.

Sanitary Engineering Conference To Meet At University of Illinois

When Leeuwenhoek reported seeing "wee beasties" through his new microscope in 1683, he didn't know what he was helping to start. From nearly three centuries away, you might say he deserves some credit for the Third Sanitary Engineering Conference at the University of Illinois. The Conference title "Disinfection and Chemical Oxidation in Water and Waste Treatment," indicates that Leeuwenhoek's wee beasties, and perhaps some he didn't see will be important topics.

The conference will be held January 31-February 1, 1961, on the University of Illinois campus in Urbana. It will be sponsored jointly by the Division of Sanitary Engineering of the Illinois Department of Public Health, and the Department of Civil Engineering of the University.

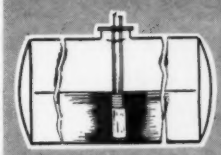
REMPE

Heat Transfer Equipment

"HOT SPOT"

PREHEATER

FOR HEAVY OILS AND LIQUIDS IN BULK STORAGE



Preheats fuel oils and other liquids to proper flow temperature before entering the suction line.

HEATS WITH STEAM OR HOT WATER

The Rempe "Hot-Spot" does an efficient pre-heating job . . . releases more BTU's from fuel oils. Special flow accumulator causes liquids to pass over heated coils. Takes the load off the suction pump.

All steel shell and coil assembly - 14" or 16" shell diameters - Connections furnished correct length for any tank.

TANK HEATER

FOR PLATING, RINSE, CLEANING AND CAUSTIC TANKS

EFFICIENT • HIGH SPEED • SOLUTION HEATING

Coil illustrated is the Rempe Hi-Therm Grid designed for fast load pickup on all liquid heating jobs. Coil Style is an exclusive Rempe pattern. Available in steel, copper and stainless steel.

Maximum prime surface increases fluid turbulence making the Rempe Grid far superior to plate coils.

Engineering Data Book

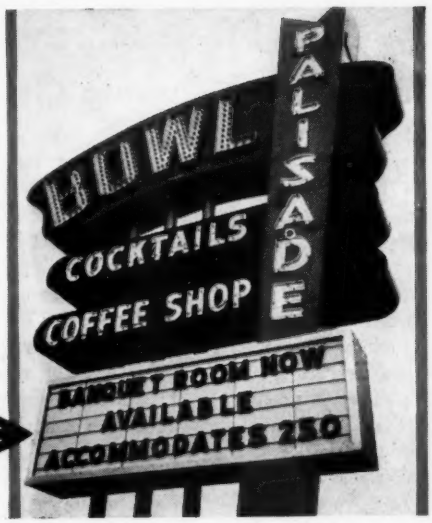
Design data for Pipe and Fin Coils. Heat transfer coefficients and other valuable and convenient engineering information. Get a copy for your library.

REMPE COMPANY

356 N. SACRAMENTO BLVD. • CHICAGO 12, ILL.

Without Electric Heat the capacity would have been only 125

Heat pumps not only gave cleaner, more efficient heating and air-conditioning, they added extra income space to the Palisade Bowl!



THE PROBLEM:

This big Chicago bowling emporium had to heat, cool and ventilate 347,985 cu. ft. of first floor space, *plus* a basement banquet hall and office wing. Heat loss load was estimated at 1,500,000 Btu (two-thirds of it to meet code requirements for ventilating).

Thousands of people were to enter and leave this building. The constantly changing atmosphere would have made conventional central heating systems inefficient and uneconomical, with the heating, cooling and ventilating elements often working against one another. This would result in excessive heat loss to the outside and constant operation.

How to heat economically within the code and have an efficient system flexible enough to handle this unstable atmospheric condition?

THE SOLUTION:

Eight 10-ton heat pumps, ingeniously installed, did the job.

The primary advantage of the heat pumps was this: they could work together or independently without working against one another. And they were easy to control. Groups of them could be controlled by a simple gang switch, or they could be controlled separately.

By installing them in such a way that each controlled a "zone" of the building, it was possible to (1) exercise instant control over the atmosphere of the entire building, and (2) heat, cool or ventilate different parts of the building separately and at the same time.

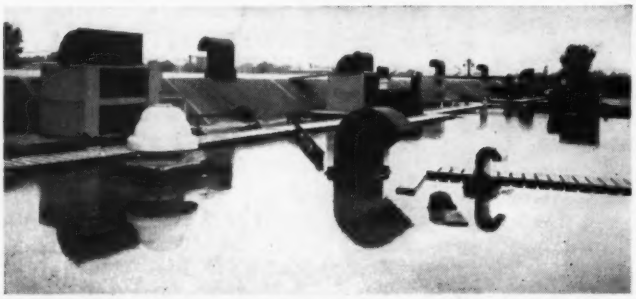
The only space taken by the heat pumps was the gap between the 9-foot ceilings and the roof. Their compressors and condensers were mounted on the roof. Not one square foot of valuable commercial space was lost!

By also using the ceiling-to-roof space as a plenum for the exhaust system an incredibly high degree of efficiency and economy was attained. In exhausting this chamber the heat pumps extract pure heat from the stale air before it is blown outside. This heat is then transferred to the incoming fresh air. Result: more heat from fewer heat pumps.

THE EXTRA BENEFITS:

A welcome plus was the addition of commercial space. None of the basement floor had to be sacrificed to a heating system. Capacity on this level was thus increased from 125 to 250 people.

There were plenty of other advantages. (1) Cleaner heat, with no smears or odors. (2) Safe heat, with no flame in the entire building. (3) Saving the additional water costs for air conditioning by the use of air-cooled condensers. (4) Constant and unlimited "fuel" supply. (5) Minimum installation investment. (6) System is custom-sized and adaptable—can be easily expanded if building is enlarged. (7) Units operate at peak efficiency at all times. (8) Greatly reduced maintenance costs. (9) No boiler scale formation.



Rooj-mounted compressors and condensers give some idea how heat pumps exercise "zone control" of building's heating, cooling, ventilating. There are no signs of a heating or air-conditioning system inside.

For additional information call your Commonwealth Edison or Public Service Company Representative

Commonwealth Edison
AND
Public Service Company

© C. E. Co.